REMARKS

Favorable reconsideration of this application in the light of the following discussion is respectfully requested. Claims 1 to 15 are pending. Claim 13 is allowed.

Substance of the Interview

Applicants thank Examiner Meagan Walling and Examiner John Barlow for the courtesies extended to the undersigned attorney during a telephonic interview on November 3, 2004. During the interview, Applicants discussed the present invention and the distinguishing elements of the original claims in view of the cited references to Wolf (U.S. Patent No. 4,173,441). The essence of that discussion is fully represented in the following remarks.

Rejections under 35 USC § 102

Claims 1, 2, 5, 8, 14, and 15 were rejected under 35 USC § 102(b) as being anticipated by Wolf (US 4,173,441).

Regarding claim 1, the Examiner averred that Wolf teaches imaging a sequential portion of the continuously moving web to provide digital information, processing the digital information with at least one initial algorithm to identify regions on the web containing anomalies, extracting identified regions from the digital information, and analyzing the extracted identified regions with at least one subsequent algorithm to determine which anomalies represent actual defects in the moving web.

The Office Action further refers to some of the dependent claims as follows:

Regarding claim 2, Wolf teaches storing or buffering the identified regions prior to analyzing.

Regarding claim 5, Wolf teaches thresholding.

Regarding claim 8, wolf teaches that at least one subsequent algorithm characterizes at least a portion of the web into quality classifications.

Regarding claim 14, Wolf teaches imaging a sequential portion of the web to provide digital information, processing the digital information with at least one initial algorithm to identify regions on the web containing anomalies, extracting identified regions

2

from the digital information, and analyzing the extracted identified regions with at least one subsequent algorithm to determine which anomalies represent actual defects in the web.

Regarding claim 15, Wolf teaches an imaging device for imaging a sequential portion of the continuously moving web to provide digital information, and computational equipment for processing the digital information with an initial algorithm to identify regions on the web containing anomalies, then extracting identified regions from the digital information, and then analyzing the extracted identified regions with at least one subsequent algorithm to determine which anomalies represent actual defects in the moving web.

Applicants' Response to the Rejections under 35 USC § 102

Applicants aver that Claims 1, 2, 5, 8, 14, and 15 are patentable under 35 USC § 102(b) over Wolf US 4,173,441 (herein after "Wolf").

The present invention is directed to a method and apparatus for inspecting a web. The method images a sequential portion of the web to provide digital information. The digital information is processed with at least one initial algorithm to identify regions on the web containing anomalies. The identified regions are extracted from the digital information. Applicants specifically point out that the digital images of the identified regions are extracted (see page 7, line 26 through page 8, line 5). The extracted identified regions are analyzed with at least one subsequent algorithm to determine which anomalies represent actual defects in the moving web. The apparatus of the present invention utilizes an imaging device for imaging a sequential portion of the continuously moving web to provide digital information. Computational equipment is then employed for processing the digital information with an initial algorithm to identify regions on the web containing anomalies, extracting identified regions from the digital information, and then analyzing the extracted identified regions with at least one subsequent algorithm to determine which anomalies represent actual defects in the moving web.

Wolf discloses an inspection system for web based materials. Wolf images the web using a laser flying spot scanner system to provide a scan signal containing digital information of the web. Selected multiple features of each generated scan signal are then extracted by means of multiple discriminator circuits employing predetermined lane feature threshold levels (column 2, lines 10-13). Applicants acknowledge that this equates to processing with a first algorithm.

3

However, Wolf does not describe extracting identified regions from the digital information. He determines features, rather than extracting identified regions of digital information, as evidenced by the discussion in column 2, line 19-22. Wolf actually discards the digital information once the features are generated. After determination of the features, Wolf suggests that a computer completes the defect classification as specified in column 2, lines 39-45. The defect classification is not equivalent to analyzing the identified regions of digital information with a subsequent algorithm. This is particularly true since Wolf initially fails to extract digital information. Wolf also indicates, in column 2, lines 66-68 that all steps must be completed in real time.

According to the MPEP, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (See MPEP 2131). Upon analysis with a first algorithm, Wolf does not extract any digital information from identified regions containing anomalies. Therefore, Wolf is incapable of reviewing the identified regions for actual defects upon analysis with a subsequent algorithm. Accordingly, Wolf is deficient as a reference against the present claims of record since Wolf fails to teach at least two elements of independent claims 1, 14 and 15. Claims 2, 5, and 8 each add additional features to claim 1. Claim 1 is patentable for the reasons given above. Thus, claims 2, 5, and 8 are likewise patentable.

Applicants have considered the proposed amendments suggested by the Examiners during the interview. The suggested amendments to the claim would introduce the preferred embodiment, as set forth set forth on page 7 lines 26 through page 8, line 5, into the independent claim. Thus applicants respectfully disagree that such amendment is warranted in view of the teachings of Wolf. Such amendment would unduly limit the scope of the claim.

Reconsidertion of the claims and withdrawal of the rejection under 35 USC § 102 is respectfully requested.

Rejections under 35 USC § 103

Wolf in view of Eichel

Claims 4, 7, and 9-12 were rejected under 35 USC § 103(a) as being unpatentable over Wolf in view of Eichel (US 6,266,437).

4

The Examiner averred that Wolf teaches all of the limitations of claims 4, 7, and 9-12 except the limitations that the initial algorithm comprises forming a blob list (current claim 4), that the continuously moving web has a pattern, and the initial algorithm used to process the digital information is capable of distinguishing between regions of the web containing perfect pattern from regions of the web containing pattern and also possible defects (current claim 7), that the identified regions contain information, as indicated by size, having at least an order of magnitude less than the digital information (current claim 9), that the subsequent algorithm includes a plurality of steps, wherein each of the plurality of steps comprises comparing each anomaly against a combination threshold-pixel size criterion (current claim 10), that an anomaly is identified as an actual defect if any oe of the criteria is satisfied (current claim 11), that at least some anomalies are reported in real time for process monitoring, process control, or both (current claim 12).

The Office Action further refers to some of the dependent claims as follows:

Regarding claim 4, Eichel et al teaches forming a blob list.

Regarding claim 7, Eichel et al teaches that the continuously moving web has a pattern, and wherein the initial algorithm uses to process the digital information is capable of distinguishing between regions of the web containing perfect pattern from regions of the web containing pattern and also possible defects.

Regarding claim 9, Eichel et al teaches that the identified regions contain information, as indicated by size, having at least an order of magnitude less than the digital information.

Regarding claim 10, Eichel et al teaches that the subsequent algorithm includes a plurality of steps, wherein eachof the plurality of steps comprises comparing each anomaly against a combination threshold pixel size criterion.

Regarding claim 11, Eichel et al teaches that an anomaly is identified as an actual defect if any one of the criteria is satisfied.

Regarding claim 12, Eichel et al teaches that at least some anomalies are reported in real time for process monitoring, process control, or both.

According to the Examiner, it would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Wolf with the teachings of Eichel et al to

5

compare anomalies against threshold-pixel size criterion. The Examiner averred that the motivation for making this combination would be to accurately locate anomalies by using precise digital information.

Wolf in view of Dalmia

Claim 3 was rejected under 35 U.S.C. 103(a) as being unpatentable over wolf in view of Dalmia et al (US 6,259,109).

The Examiner stated that Wolf teaches all the limitations of claim 3 except the limitations that the stored or buffered information is analyzed after the imaging has been performed on the entire web (current claim 3).

Regarding claim 3, The Examiner indicated that Dalmia et al teach storing the recorded image of the web and playing it back for analysis after recording is complete.

According to the Examiner, it would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Wolf with the teachings of Dalmia et al to store the identified regions prior to analyzing. The Examiner stated that the motivation for making this combination would be to play back the stored image at a slower speed for easier inspection.

Wolf in view of Floeder

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Wolf in view of Floeder et al (US 2002/0110269). The Examiner averred that Wolf teaches all the limitations of claim 6 except the limitation that the continuously moving web is unpatterned. The Examiner also noted that Wolf teaches locating defects on unpatterned polymeric films.

The Examiner averred that it would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Wolf (Note: The Office Action, in paragraph 4, indicated Eichel et al. However, applicants believe Wolf was intended) with the teachings of Floeder et al to find defects in unpatterned webs. The Examiner suggested that the motivation for making this combination would be to find defects in all types of materials and to not limit defect detection to patterned webs.

6

Applicants Response to the Rejections under 35 USC § 103

<u>Wolf in view of Eichel</u>

Claims 4, 7, and 9-12 are patentable under 35 USC § 103(a) over Wolf in view of Eichel (US 6,266,437).

The present invention, as recited in independent claim 1, has been distinguished from Wolf for the reasons set forth in the applicants response to the rejection under 35 USC § 102. Claims 4,7 and 9-12 are all depend, directly or indirectly on claim 1.

Eichel is directed to a system for detecting defects on a moving web. The system of Eichel utilizes a comparitor frame to compare elements from a real time image of the moving web. The comparitor utilizes sequential detection on pairs of elements to provide an acceptable indication of the elements versus the comparitor frame. The comparitor provides a "look-again" indication if the pair of elements are determined to be neither acceptable of defective. In the "look-again" situation, the comparitor recursively compares the elements of the exemplar frame with corresponding elements of other frames in the web until an acceptable or defective indication occurs.

Eichel does not describe an inspection system that extracts identified regions that may contain anomalies and then subjects those regions to at least one subsequent algorithm to determine if those regions truly contain defects. Applicants specifically point out that the "look-again" feature described in Eichel only reviews subsequent frames and fails to either extract the region in question or run an additional analysis on that particular region.

According to the MPEP, "[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) <u>must teach or suggest all the claim limitations</u>." See MPEP 2143 (emphasis added).

Applicants assert that the combination of Wolf and Eichel would not result in the present invention. Neither reference, as set forth by the Examiner, include the elements of extracting identified regions of digital information that may contain anomalies and then subjecting those regions to at least one subsequent algorithm to determine if those regions truly contain defects.

7

Since the combination of Wolf and Eichel fail to teach, suggest or disclose all the claim limitations, such references would render the claims obvious.

Withdrawal of the rejection of claim 4, 7 and 9-12 is respectfully requested.

Wolf in view of Dalmia

Applicants traverse the rejection of Claim 3 under 35 U.S.C. 103(a) as being unpatentable over wolf in view of Dalmia et al (US 6,259,109). Wolf has been distinguished from independent claim 1 for the reasons set forth in the rejection under 35 USC § 102. Claim 3 directly depends on claim 1.

Dalmia teaches and describes a web inspection system for the analysis of a moving web of material. The system of Dalmia records and stores continuous sequences of the web. The system includes a video display for viewing the saved images. The reference also suggests a processing system that is capable of classifying defects (see column 3, lines 22-29). However, Dalmia fails to teach, suggest or disclose the identification of anomalies, the extraction of the identified regions containing anomalies, or the analysis of extracted regions with at least one subsequent algorithm to determine which anomalies represent actual defects.

Applicants aver that the combination of Wolf and Dalmia would not result in claim 3. The references fail to teach, suggest, or disclose the elements of extracting identified regions of digital information that may contain anomalies and then subjecting those regions to at least one subsequent algorithm to determine if those regions truly contain defects. Withdrawal of the rejection of claim 3 is respectfully requested.

Wolf in view of Floeder

Applicants aver that Claim 6 is patentable under 35 U.S.C. 103(a) over Wolf in view of Floeder et al (US 2002/0110269). Wolf has been distinguished from the Independent claim 1 for the reasons set forth above.

Floeder utilizes filters, binarizers and blobbers to place the digital data stream into a form that is suitable for timely defect analysis. Applicants acknowledge that the reference discloses the use of the system for unpatterned webs. However, the unpatterned webs are subjected to a

single analysis to "determine if they represent defective portions of the web or just anomalies that are not defective." (see paragraph 0068 on page 6 of the published application).

The combination of Wolf and Floeder is deficient from the standpoint that the combination does not describe the elements of extracting identified regions of digital information that may contain anomalies and then subjecting those regions to at least one subsequent algorithm to determine if those regions truly contain defects.

Thus applicants respectfully request withdrawal of the rejection of claim 6.
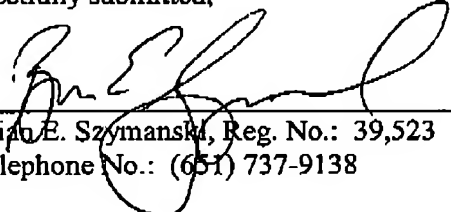
Conclusion

In view of the foregoing remarks, favorable reconsideration of the present application and the passing of this case to issue with all claims allowed is courteously solicited.

Should the Examiner wish to discuss any aspect of this application, applicants' attorney suggests a telephone interview in order to expedite the prosecution of the application.

Respectfully submitted,

December 9 , 2004

Date

By:

Brian E. Szymanski, Reg. No.: 39,523
Telephone No.: (651) 737-9138

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833

9